

**Annual Report
of the
SECRETARY OF DEFENSE**

July 1, 1962, to June 30, 1963

Letter of Transmittal

THE SECRETARY OF DEFENSE

WASHINGTON

May 20, 1964

DEAR MR. PRESIDENT:

In compliance with Section 202(d) of the National Security Act of 1947, as amended, I submit the annual report of the Secretary of Defense for fiscal year 1963, together with the reports of the Secretaries of the Army, Navy, and Air Force for the same period.

Yours sincerely,



ROBERT S. McNAMARA

THE PRESIDENT

THE WHITE HOUSE

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I. Guarding the National Security

During fiscal year 1962, the armed forces continued to carry out successfully their basic mission of protecting the national security interests of the United States. They provided the military strength that made it possible to ward off the challenge of Soviet missiles in Cuba. They rendered vital assistance to friendly countries threatened by aggression and subversion. They, together with the forces of our allies, maintained an effective guard over the frontiers of the free world.

At the same time, notable gains were achieved in combat effectiveness, readiness, and flexibility. In line with policies and programs initiated in 1961, the size of our retaliatory forces as well as their survivability in case of surprise attack increased considerably. Further progress was made in developing an effective command and control system. The general purpose forces benefited from substantial deliveries of modern weapons and equipment, greatly improving their readiness as well as striking power. The mobility of strategic reserves was increased with the delivery of additional transport aircraft. Adjustments in the reserve components provided an organization better designed to meet the urgent reinforcement requirements of the active forces. The plans and programs approved during the fiscal year will help to maintain the effectiveness of our armed forces in the years ahead.

While the progress made in tailoring the armed forces to current and future requirements has been encouraging, it should not be concluded that all major problems have been solved. The Department of Defense will continue to be confronted with critical and difficult decisions. Changes in the world situation and technological breakthroughs may greatly alter our current forecasts of future developments. These forecasts may also be affected by continuing studies on the full-scale development and deployment of new weapon systems, the future size and composition of our naval forces, the effectiveness of ballistic missile defenses, the rate of modernization of tactical and strategic aircraft, the military space program, and many similar matters. Equally important is an accelerated improvement in management efficiency to insure that Defense activities are carried out at the lowest possible cost. The successful resolution of such problems will require in the future as it has in the past a close cooperative effort by the Executive Branch and the Congress.

The Cuban Crisis

The importance of maintaining an adequate, ready, and flexible Defense establishment was clearly illustrated in the fall of 1962 when the Soviet Union moved ballistic missiles into Cuba.

Starting in late July 1962, evidence of increased Soviet military assistance to Cuba accumulated. The presence of air defense missiles was confirmed from pictures taken on August 29. A determination that certain shipping crates noted on September 28 aboard Cuba-bound ships contained IL-28 medium-range bombers was made on October 9. Conclusive proof of the presence of medium-range ballistic missiles did not become available until the analysis of photographs taken on October 14 was completed on the next day. Further photographic evidence on the size and the type of the Soviet buildup was obtained during the following days as the high altitude air surveillance, assigned to the Strategic Air Command on October 12, was greatly increased by Presidential order.

This sudden clandestine introduction of clearly offensive weapons of mass destruction constituted a direct threat to the peace and security of the Western Hemisphere. It had to be countered quickly and effectively. During the week of October 15, the President and his civilian and military assistants canvassed the alternative courses open to the United States. The conclusions reached, as announced to the Nation by the President on October 22, called for a strict quarantine on all offensive military equipment under shipment to Cuba, increased close surveillance of Cuba, reinforcement of our base at Guantanamo, and various diplomatic measures, including the endorsement of the quarantine by the Organization of American States. When this endorsement was given on October 23, the President issued Proclamation 3504 establishing the quarantine effective on October 24 and directed the Secretary of Defense to take appropriate measures.

Military steps to meet the current emergency had been initiated during the previous week. Better than normal security was maintained, aided by the previous scheduling of routine amphibious and other naval exercises in the Caribbean and Atlantic areas and by the gradual buildup of air defenses in the southeastern United States started early in the year. Nevertheless, rumors of increased military activities began to circulate, but it was vital to the success of our policy that maximum secrecy be maintained until our course of action was firmly determined, our information on Soviet activities as complete as possible, and our armed forces ready to carry out their assignments.

Since it was not known what course the Soviet Union would choose to follow, the armed forces had been ordered "to prepare for any eventualities," and almost the entire Defense establishment was placed on alert status.

In case the Soviet Union determined to unchain a nuclear attack, our retaliatory forces were ready to counter. Starting on October 20, the Strategic Air Command (SAC) began dispersing its bombers and placed all aircraft on an upgraded alert—ready to take off, fully equipped, within 15 minutes. On October 22, the B-52 heavy bombers started a massive airborne alert, involving 24-hour flights and immediate replacement for every aircraft that landed. ICBM (Intercontinental Ballistics Missile) crews assumed a comparable alert status. POLARIS submarines went to sea to preassigned stations. The tremendous nuclear firepower of the United States was deployed to discourage any reckless challenge.

Our air defense forces, under the operational control of the North American Defense Command (NORAD), were equally ready for any emergency. Fighter interceptors and HAWK and NIKE-HERCULES missile battalions were moved to the southeast to supplement local air defense forces. After October 22, interceptor units were either on patrol missions or on a 5-to-15-minute alert.

The general purpose forces of the Army, Navy, and Air Force started to organize for the emergency on October 16. The command organization, as finally developed, called for the Commander in Chief, Atlantic (CINCLANT), to provide the unified command. He also retained control of all naval components involved in tactical operations, as the Commander of the U.S. Fleet, Atlantic. The responsibility for Army and Air Force components was assigned to the Continental Army Command (CONARC) and the Tactical Air Command (TAC) under the designation of Army Forces, Atlantic (ARLANT), and Air Forces, Atlantic (AFLANT). The commander of the Army XVIII Airborne Corps was designated Joint Task Force Commander to plan for any joint operations that might become necessary. Over-all direction was exercised by the President and the Secretary of Defense through the Joint Chiefs of Staff, who named the Chief of Naval Operations as their representative for the quarantine.

The operational control of the quarantine force was assigned to the Commander of the Second Fleet, who organized Task Force 136 for this purpose. Effective deployment constituted a mammoth task to be accomplished in minimum time. To prevent future difficulties, plans had to be developed, ship captains briefed, supply ships dispatched, and thousands of details checked. Other Navy and Marine forces faced similar tough schedules. Marines, if not already engaged in landing exercises, were loaded on amphibious ships and ordered to sea. At Guantanamo, dependents were evacuated to the United States on October 22, and Marine units were shipped by air and sea to reinforce the base. Task Force 135, including the carrier *Enterprise*, was sent to the south of Cuba, ready to join in the defense

of Guantanamo if needed. The carrier *Independence* and the supporting ships of Carrier Division Six stood by to provide additional support. Antisubmarine forces were redeployed to cover the quarantine operations. An intensive air surveillance of the Atlantic was initiated, keeping track of the 2,000 commercial ships usually in the area; regular and reserve Navy aircraft were joined in this search by SAC bombers.

Major elements of the Strategic Army Corps (STRAC) were designated for use by ARLANT and placed in advanced alert status. Logistic support for the more than 100,000 men involved was directed by a newly established Peninsula Base Command. Preparatory steps were taken to make possible the immediate callup of high priority Army National Guard and Army Reserve units. Air support for the ground forces was provided by the TAC, which moved hundreds of tactical fighter, reconnaissance, and troop carrier aircraft to the southeast. To make room for all these units, the bombers, tankers, and other aircraft not required for the current operations were ordered to other bases in the United States.

This massive movement of ships, aircraft, and troops, together with their weapons and equipment, was carried out with unprecedented speed. The forces alerted were ready for their assignment when the President addressed the Nation on the evening of Monday, October 22. Low altitude reconnaissance flights over Cuba started on October 23. When the Quarantine Proclamation became effective at 10:00 a.m. (EDT) on October 24, air and surface units of the Atlantic Fleet were at their designated stations. Whether or not other units would be called upon to carry out their operational missions remained an unanswered question throughout this week of maximum danger.

Photographic intelligence continued to show a rapid buildup of offensive weapons in Cuba. The construction of permanent sites for intermediate-range ballistic missiles was noted, in addition to the deployment of the mobile medium-range type. On the other hand, the potentially dangerous confrontations inherent in the quarantine failed to develop. On October 25, the first Soviet ship, the tanker *Bucharest*, was intercepted without incident and permitted to proceed after it was determined without boarding that it carried oil and no prohibited material. On the same day it was confirmed that other Cuba-bound Soviet ships, likely to require closer inspection, had changed course, possibly to return to their home ports. On October 26, the freighter *Marucla*, flying the Lebanese flag but chartered by the Soviet Government, was boarded and cleared after a brief inspection. Tension increased on October 27, when a U-2 aircraft, piloted by Maj. Rudolf Anderson, Jr., USAF, was destroyed. Later in the day, the Secretary of Defense asked the Air Force to call 24 troop carrier squadrons and their supporting units to active duty, involving about 14,000 Air Force Reservists.

The break in the crisis came on Sunday, October 28, when the Soviet Government finally agreed to dismantle its offensive weapons in Cuba and return them to the Soviet Union subject to United Nations verification. If this pledge were carried out, additional military actions would become unnecessary. Quarantine measures and aerial surveillance, however, remained in effect. They were suspended temporarily only for 2 days, October 30 and 31, while the Secretary General of the United Nations was trying unsuccessfully to reach an agreement with the Cuban Prime Minister on verifying the removal of offensive weapons. While decreased activity at the missile sites was noted on October 29, it was not until November 2 that it could be announced that the dismantling of the weapon systems had definitely been started. During the following days, aerial reconnaissance provided detailed information not only on the progress made in this work but also on the transfer of the missile systems to Cuban ports and the loading of 42 missiles and their support equipment on eight Soviet ships. These ships sailed between November 5 and 9, and a final visual check was made as each of them passed the quarantine.

Still unresolved, however, was the future of 42 IL-28 medium-range bombers. Their removal entailed further diplomatic negotiations that were not concluded successfully until November 20. The return of these bombers to the Soviet Union was checked as carefully as that of the missiles. All of them left Cuba on December 5 and 6, loaded on three Soviet ships.

Concurrently with the Soviet commitment on the IL-28's, the United States Government announced the end of the quarantine effective at 6:45 p.m. (EDT), November 20, 1963. Fifty-five Cuba-bound merchant ships had been checked during the 4-week quarantine; none was found to carry any prohibited material. With the end of the quarantine, the ships of Task Force 136 as well as those of the more recently formed Inter-American Quarantine Force, composed of Argentinian, Dominican, Venezuelan, and United States units, returned to normal duties. The special alert activities of our armed forces at home and abroad gradually were reduced, and the units no longer required were returned to their permanent stations. The Air Force Reserve units called to active duty were released by the end of November, and the extension of tours of duty for Navy personnel, ordered on October 24, was canceled. Only aerial reconnaissance sorties were continued, since the on-site verification of the removal of all offensive weapons, originally agreed upon by the Soviet and the United States Governments, continued to be opposed by Cuba.

The Cuban crisis demonstrated the readiness of our armed forces to meet a sudden emergency. It also highlighted the importance of maintaining a properly balanced Defense establishment, including not only retaliatory forces of overwhelming strength but also ade-

quately trained and equipped units in sufficient numbers for lesser types of action. This military flexibility was a major factor in bringing about the removal of a dangerous threat to the security of the United States. While our armed forces carried out their assignments well, numerous lessons were learned, insuring that any future emergency will be met with even greater efficiency. The officers and men, both regular and reserve, who participated in the Cuban operation and, above all, the Navy, Marine, and Air Force pilots who collected the hard intelligence required for a successful national policy rendered an outstanding service to their country.

Assistance to Vietnam

Less dramatic but even more hazardous has been the task assigned to U.S. military personnel on duty in Vietnam. By the end of the fiscal year, about 14,000 men were assisting the Vietnamese Government in its struggle against Communist subversion. Under the direction of the Military Assistance Command, Vietnam (MAC/V), a unified command subordinate to the Commander in Chief, Pacific (CINCPAC), they were providing training, airlift, communications, and advice to Vietnamese forces and administering an extensive military assistance program. The principal objective of these efforts was to help the people of Vietnam to maintain their independence and the territorial integrity of their country.

The United States substantially increased its assistance to the Vietnamese Government in 1961 after Communist guerrillas, directed and supported by North Vietnam, had stepped up their campaign of terror, propaganda, and armed attack. As a result of careful field studies, it was determined that the objective of helping the Vietnamese win their war involved not merely standard training in counterinsurgency operations and in the use and maintenance of U.S. material, but also advice in the field on the best tactics to be employed and the most effective use in combat of the weapons and equipment furnished. Unfortunately, this extended type of assistance has also been accompanied by U.S. casualties. Between January 1, 1961, and July 1, 1963, 48 members of the U.S. armed forces died as the result of hostile actions and 210 were wounded. These men as well as their companions who risk their lives day after day deserve the deep gratitude of all Americans.

In order to express this gratitude, the President authorized the award of the Bronze Star medal to U.S. military personnel serving with friendly troops in engagements against opposing forces with which the United States is not at war. He also requested the Congress for authority to award our highest combat decorations, including the Medal of Honor, for heroism in cold war actions. The Congress ap-

proved the President's proposal and, in addition, authorized the presentation of Gold Star lapel buttons to the next of kin of members of the armed forces who lose their lives in cold war incidents.

Military assistance to Vietnam, besides providing combat training and advice, has also proved helpful in many related areas. It has been applied to the construction of strategic fortified hamlets, designed to protect Vietnamese farmers against Vietcong attacks and against levies on their resources. It has been used for training militia and paramilitary forces for the static defense of these hamlets, thus freeing regular units from such duties and making it possible for them to seek out and destroy the enemy. It has supported numerous forms of "civic action," designed to improve the living standard of the local population with the help of military personnel. As a result, the Vietnamese as well as our own armed forces are gaining increased experience in dealing with the multitude of problems connected with counterinsurgency operations.

Frequent conferences of responsible U.S. officials have assured the closest possible coordination between Washington and the field and have greatly expedited the implementation of the program. As a result of our help, local resistance is being bolstered, and weapons and equipment for countering Vietcong aggression are becoming available in steadily increasing quantities. Progress will depend to a large degree on the continued determination of the Vietnamese people to resist Communist tyranny. The battle of Vietnam is a battle for men's minds. The full recognition of this fact and its implications is essential for eventual success.

Nuclear Testing

In response to the resumption of atmospheric nuclear testing by the Soviet Union on September 1, 1961, the United States started underground testing in Nevada 2 weeks later and atmospheric tests in the Pacific on April 25, 1962. The latter series, known as Operation DOMINIC, were concluded on November 4, 1962, after 36 nuclear devices were tested, including 29 dropped from aircraft, 5 high altitude detonations; and 2 weapon systems tests. All of the Pacific Ocean tests were carried out jointly by the Atomic Energy Commission and the Department of Defense through Joint Task Force 8.

These tests contributed substantially to our nuclear weapons program. Two complete weapon systems, the POLARIS missile and the ASROC antisubmarine rocket, were fired under operational conditions, confirming the reliability of these weapons. Tests of warheads designed after the 1958 test series verified the soundness of new designs. Valuable information was obtained on new theoretical concepts for increasing yield per pound of weight, achieving a more efficient use of nuclear materials, reducing radioactive fallout, and

improving the safety and reliability of weapons. High altitude effects tests provided additional data on the ability of our retaliatory and continental defense forces, including our communications systems, to operate in a nuclear environment.

In general, the 1962 test series conducted by the United States confirmed the effectiveness of the existing weapons and pointed the way toward further improvements. While the Soviet Union also gathered considerable information from its two test series, held from September to November 1961 and from August to December 1962, it was concluded after a careful analysis that the nuclear superiority of the United States was not overtaken by the Soviet tests. This factor was one among many that encouraged President Kennedy to try once more to halt the increasing pace of the arms race. On June 10, 1963, he announced that direct negotiations on a test ban treaty were being resumed by the United States, the United Kingdom, and the Soviet Union, and less than 7 weeks later, on July 25, a draft treaty banning nuclear tests in the atmosphere, in outer space, and under water was initialed by the three governments.

This treaty will not alter the nuclear superiority of the United States over the Soviet Union. To assure the continued adequacy of our military arsenal, atomic laboratories will maintain an active research and development program, and underground tests, which are permitted under the treaty, will provide essential data for further weapons improvements. To counter any disadvantages that might result from a sudden unilateral abrogation of the treaty by the Soviet Union, the United States will maintain a periodically up-dated readiness-to-test program, making possible the initiation of atmospheric tests within the shortest possible time. In addition, a substantial effort will continue to be made to improve our capabilities to detect and identify nuclear tests in any environment.

Our nuclear test policy, like the actions taken concerning Cuba and Vietnam, illustrated once more the close integration that has been developed within the Federal Government of all activities related to our security. Military strength is a prerequisite for an effective national policy, but it does not constitute an end in itself. It is most useful when it can provide the President with a wide range of alternative actions in his constant search for the best means to protect the Nation's interests and security. The military programs established during the past 2 years have greatly assisted in meeting this requirement.

II. Operational Forces

Current defense programs call for armed forces of sufficient strength and flexibility to respond quickly to any type of aggression with whatever degree of force is needed. The framework for such a military establishment was outlined in 1961, and the first steps toward the new objective were taken during fiscal year 1962. Fiscal year 1963 brought us considerably closer to the established goals, particularly through a greatly accelerated modernization of weapons and equipment. (See tables 1 and 2.)

Active duty military personnel totaled 2,700,000 on June 30, 1963. This total represented an increase of 216,000 over that on June 30, 1961, but a decrease of 108,000 as compared to the military personnel strength on the same date in 1962. The high 1962 level was caused by the temporary retention on active duty of reserve forces mobilized during the Berlin crisis in the fall of 1961. A strength level slightly below 2,700,000 is planned for the immediate years ahead.

The chain of command for the operational direction of the armed forces—from the President and the Secretary of Defense through the Joint Chiefs of Staff to the unified and specified commands—remained unchanged, but some adjustments were made in the structure of the unified and specified commands. On June 6, 1963, the Caribbean Command, with headquarters at Quarry Heights, Panama Canal Zone, was renamed the U.S. Southern Command to indicate more accurately its broad geographical responsibilities for the southern part of the Western Hemisphere. After the close of the fiscal year, the commander of the U.S. Strike Command was directed to assume additional duties as Commander in Chief, Middle East, Africa, and Southern Asia (MEAFSA). U.S. Naval Forces, Eastern Atlantic and Mediterranean, a specified command located at London, was disestablished.

Also reporting through the Joint Chiefs of Staff are three agencies carrying responsibilities closely related to operational control—the Defense Atomic Support Agency (DASA), the Defense Intelligence Agency (DIA), and the Defense Communications Agency (DCA). DASA played a major role in the atomic tests conducted during 1962.

DIA, established in August 1961, extended its activities as planned from the current intelligence field into the intelligence production area, assuming operational control of the Air Force Production Center in January 1963 and of counterpart Army and Navy elements a month

later. The agency was also assigned responsibility for establishing and operating a joint Defense Intelligence School, for exercising management control over the mapping, charting, and geodetic efforts of the military Services, and for supervising technical intelligence activities. Thus, during fiscal year 1963 DIA steadily increased its capacity for providing effective intelligence support to Washington headquarters and the major military commands.

DCA, which became operational in March 1961, further augmented its capability during fiscal year 1963 for meeting the long-haul, point-to-point telecommunications requirements of the armed forces. Additional facilities were interconnected to provide greater flexibility, new channels were provided in areas that had been inadequately served, and duplicating circuits and switching points were consolidated to eliminate unnecessary redundancy. The effective monitoring of communications traffic was improved with the activation of six small regional communications control centers to supplement the national control center and the four key regional centers. Thus, substantial progress was made toward the goal of a single Defense Communications System that will satisfy the needs of all Defense users with maximum efficiency and economy. The agency was also assigned during the year new responsibilities for operating the military damage assessment system—formerly a responsibility of DASA—for assuring the compatibility of ground and space-borne equipment for military communications satellite programs, and for developing and supporting the National Military Command System. The National Military Command System includes not only the facilities in Washington but also alternate command posts—underground, airborne, and afloat—and the links to field headquarters. This system is designed to be ready for operations around the clock and provides national authorities with a secure and survivable means for the strategic direction of our armed forces in any circumstances.

Retaliatory Forces

The program, initiated in 1961, for accelerating the buildup of our retaliatory forces and for increasing their survivability remained on schedule during fiscal year 1963. By June 30, 1963, about 500 ICBMs and POLARIS missiles were operational. The emergency readiness of the manned-bomber elements showed further improvement. As before, there was no question during fiscal year 1963 that our strategic retaliatory forces were fully capable of destroying the Soviet target system, even after absorbing an initial surprise attack. The programs planned for the further improvement of these forces will insure that the United States retains this capability in the years ahead and that a convincing deterrent to a nuclear attack on our country is maintained.

In building up its missile forces, the Department of Defense has placed major emphasis on the solid-fueled MINUTEMAN and POLARIS missiles. The first two MINUTEMAN flights were turned over to the operational control of the Strategic Air Command in December 1962 and by the close of the fiscal year a total of 160 missiles were in place. These highly reliable missiles, emplaced in dispersed, hardened underground silos, are maintained ready for almost instantaneous launching in the event of an enemy attack. The number of operational POLARIS missiles rose from 96 to 144 during the year as the ballistic missile submarine force deployed at sea increased from six to nine. On June 30, 1963, three additional POLARIS submarines were in commission but had not yet joined the fleet.

As for liquid-fueled ICBMs, the program for 13 ATLAS squadrons, aggregating 126 missiles, was completed during the fiscal year as 6 ATLAS-F squadrons became operational between September and December 1962. The TITAN program also progressed as planned. TITAN I squadrons increased from four to six and the first of six TITAN II squadrons, equipped with storable fuel, entered the operational inventory. All of the 12 programmed TITAN squadrons, with 108 missiles on launchers, were scheduled to be operational at the close of calendar year 1963.

The striking power of our strategic bomber force is being increasingly concentrated on the 14 wings of B-52 heavy bombers and the 2 wings of B-58 supersonic medium bombers. Seven of the 20 wings of B-47 medium bombers, procured in the late 1940's and early 1950's, were phased out of the force structure during the past 2 years as additional strategic missile units became available. Half of our bomber force is being kept on 15-minute ground alert with a small number on airborne alert, and spare parts have been acquired to fly, if necessary, one-eighth of the B-52 force on airborne alert for about 1 year. The in-flight refueling capabilities of our bombers improved during fiscal year 1963 with further deliveries of KC-135 jet tankers, and the increased inventory of HOUND DOG air-to-surface missiles added to their stand-off-attack and penetration potential.

The SKYBOLT project for an air-to-surface ballistic missile, designed to replace the aerodynamic HOUND DOG, was canceled in December 1962. This missile turned out to be considerably more expensive to develop and produce than had been anticipated as serious technical difficulties were encountered. In addition, it was overtaken by the successful development of other weapons that could carry out the task of suppressing enemy defenses at substantially lower cost. As a result, SKYBOLT lost its status as a vital defense requirement, and its marginal contribution to our national security provided insufficient justification for its high cost.

The 5-year program for our retaliatory forces calls for the retention through the 1960's of a mixed force of bombers and missiles with the proportion of missiles steadily increasing. Survivability and reliability will continue to receive primary emphasis. Major reliance will be placed on the MINUTEMAN and POLARIS, both of which pose extremely difficult targeting problems for an enemy. As greater numbers of these weapons are deployed, some of the older, more vulnerable ATLAS and TITAN missiles will be phased out of the inventory.

The MINUTEMAN program, as funded through the fiscal year 1963 budget, provides for a total of 800 MINUTEMAN I missiles, to which the fiscal year 1964 program added 150 MINUTEMAN II missiles. The great improvements in range, accuracy, and flexibility in targeting and launching offered by the new MINUTEMAN model led to a review of the entire program after the close of the fiscal year, and it was concluded that the replacement of MINUTEMAN I with MINUTEMAN II missiles earlier than previously planned would enhance the over-all effectiveness of the force, although accompanied by a slight reduction in the buildup rate. At the same time, work is continuing to provide further improvements in propulsion, structure, and guidance as well as in the field of penetration aids designed to confuse enemy defense. A study of new advanced ICBM concepts was initiated in fiscal year 1963, and the development of a Medium-Range Ballistic Missile (MRBM) system for possible use in the NATO area was also continued.

The planned POLARIS program remained at a total of 41 submarines. The last six of these were fully funded in the fiscal year 1964 budget. The acceleration and expansion of the POLARIS program, ordered in 1961, will result in dramatic increases in the size of the POLARIS fleet during the next few years. While 9 POLARIS submarines were deployed with the fleet on June 30, 1963, and 3 more had been commissioned, an additional 11 had already been launched, 12 more were under construction, and long leadtime items were being procured for the remaining 6. The increase in the striking power of this submarine fleet will be even greater than its numerical increase. Submarines 19 through 41 will be equipped with the A-3 missile which has a range of 2,500 nautical miles, and the same advanced missile will replace the 1,250 nautical mile A-1 model, currently on board the first 5 vessels. Submarines 6 through 18 will be equipped with the 1,500 nautical mile A-2 version. Thus, the POLARIS fleet, as currently planned, will consist ultimately of 28 submarines with A-3 missiles and 13 with A-2's. Further improvements of the A-3 model are under intensive study.

As for the strategic bombers, the B-52's and B-58's will be maintained at about their current strength level throughout the 1960's. The B-47's are scheduled to be phased out of the inventory. The continued effectiveness of the B-52 force is being assured by an extensive modification program, including the structural strengthening of the aircraft, as well as by the addition of new equipment. These modifications also enhance the ability of the B-52's to carry out new tactical concepts. Further delays were encountered in the development of the XB-70 hypersonic aircraft as a result of technical difficulties encountered in sealing the fuel cells and in fabricating the wing fuselage joint. Continued research, however, is expanding the technological base for the design of more advanced aircraft, the need for which is under constant review.

Continental Defense

Operational responsibility for continental defense is vested in the North American Air Defense Command (NORAD), a combined U.S.-Canadian command with headquarters at Colorado Springs, Colo. Composed of elements from the U.S. Army, Navy, and Air Force and from the Royal Canadian Air Force, NORAD coordinates and directs the activities of about 175,000 people. Its major components include early warning, command, control, and communications systems, manned aircraft and surface-to-air missiles, the Ballistic Missile Early Warning System (BMEWS), and the Space Detection and Tracking System (SPADATS).

Continued progress was made during fiscal year 1963 in practically all continental defense activities. Primary emphasis was placed on improving the survivability of our existing system in case of missile attack and on developing an antimissile missile that might provide an effective defense against long-range enemy missiles. In addition, NORAD forces were realigned during the year to furnish greater protection for the southeastern United States, as the temporary assignment of additional aircraft and air defense missiles to that area at the time of the Cuban crisis was subsequently made permanent.

Adjustments in our defense against enemy bombers were made in response to rising enemy missile capabilities which posed an increasing threat to the Semi-Automatic Ground Environment (SAGE) facilities, constructed without protection against missile attack and frequently located near prime target areas. Since it would have been practically impossible to harden these facilities—designed to detect, identify, and direct the interception and destruction of enemy bombers—substitute measures had to be taken. As a first step, manual direction equipment was installed in fiscal year 1962 at a number of prime radar sites to enable these stations to identify enemy aircraft and direct our interceptors against them without any help from

SAGE. Additional communications links were also established, and fallout protection and shielding was being provided for the crews. These emergency measures were followed, starting in fiscal year 1963, by the introduction of a more effective, computerized Back-Up Interceptor Control (BUIC) system at stations located outside of possible prime target areas. With these developments, reductions in the SAGE system became feasible. Six of the 21 SAGE direction centers originally programmed were selected for deactivation, and more are expected to be phased out when the BUIC system becomes fully operational.

A reexamination of the requirements for search radars resulted in a decision to eliminate 23 existing sites and establish 16 new ones, for a net reduction of 7. To provide more effective surveillance, responsibility for the Greenland and Iceland-United Kingdom extension of the DEW line was shifted from radar picket ships to aircraft during the fiscal year.

As for manned interceptors, greater protection has been provided by increasing to one-third the proportion of aircraft on 15-minute alert or less and by preparing additional airfields for dispersed operations. The dispersal program when completed will make it possible to deploy one-fourth of the interceptors away from their home bases. No major numerical changes occurred or were planned in the composition of continental defense interceptor units of the active Air Force—composed of all-weather F-101's, F-102's, F-104's, and F-106's. The effectiveness of Air National Guard units will be upgraded as F-102's from the active forces replace the older models currently available. The problem of further modernizing our manned interceptor force was submitted to careful review during the past year, and the results indicate that possible future bomber threats might be countered in several different ways, including aircraft already in production or under development as well as a completely new interceptor (IMI). Determination of the proper course to follow will depend on further information concerning, among other factors, the particular nature of the enemy bomber threat in the years ahead. Meanwhile, research and development work is being continued on all various systems that might be used.

Changes in the air defense missile field included the permanent assignment to NORAD of one NIKE-HERCULES battalion and two HAWK battalions, temporarily moved to the Florida area during the Cuban crisis. The transfer of NIKE-HERCULES missiles from the active Army to the National Guard to replace the NIKE-AJAX continued as planned with the objective of retiring all AJAX missiles in the near future. Plans are also being developed by the Air Force to eliminate BOMARC-A missiles, which lack a low altitude capability

and have a range of only 200 miles; the more versatile 400-mile-range BOMARC-B will be retained at six bases.

In the field of ballistic missile defense, the BMEWS constitutes our primary source for advance warning of an attack. It represents an investment of about \$1.0 billion. Of the three BMEWS stations, the ones at Thule, Greenland, and Clear, Alaska, were in operation during the past fiscal year, while the one at Fylingdales, England, was scheduled to start operating before the end of calendar year 1963. The addition of a new tracking radar at Thule and the installation of improved electronic countermeasures substantially increased the system's capabilities. Various other improvements are under study, including the development of over-the-horizon radar, which could provide earlier information on missile attacks and additional confirmation of the data gathered by BMEWS. As successor to the Bomb Alarm System, designed to relay information on nuclear detonations in the NORAD area, an improved Nuclear Detection and Reporting System (NUDETS) is being tested. The new equipment would furnish automatically much additional information to military as well as civil defense authorities for purposes of damage assessment and fallout prediction.

The program for the development of an antimissile weapon was re-oriented in fiscal year 1963 to incorporate improvements essential for an effective defense. The newly established NIKE-X development will include three features that had not been planned for its predecessor, the NIKE-ZEUS. First, the new high-acceleration SPRINT missile will, with its speed, provide additional time for discriminating between warheads and decoys. Secondly, the proposed Multifunction Array Radar (MAR) will have the capability to detect and track a large number of objects simultaneously. And finally, the components of the system can be sufficiently hardened to make a direct attack on these defense facilities unprofitable. The development contract for SPRINT was awarded in March 1963, and work was started on the construction of a prototype MAR. Continuing tests of the NIKE-ZEUS provided additional information on reentry phenomena and defense techniques, and the successful interception from Kwajalein Island of test vehicles launched 5,000 miles away by ATLAS and TITAN boosters demonstrated the basic soundness of the ZEUS equipment. Scientific research covering many aspects of the missile defense problem is being carried forward under Project DEFENDER, administered by the Advanced Research Projects Agency. Considerable effort is also being expended on improving our capabilities to counter submarine-launched missiles, while advanced methods to detect, track, and destroy enemy submarines are being studied as part of our over-all antisubmarine warfare program.

The resolution of technical problems, however, can not by itself determine the eventual deployment of an antimissile defense system. Its potential effectiveness must be weighed against many additional factors, including the degree of protection provided against various types of attack, the cost of deployment to the United States in comparison with the cost to an aggressor developing means to penetrate the new defenses, and, above all, the extent to which the system is backed up by an adequate civil defense shelter program to reduce the loss of American lives. A careful evaluation of strategic and economic considerations of this type is essential before a final decision on deployment can be reached. Our immediate objective, however, is to pursue the development of the NIKE-X system with highest urgency. Success in this undertaking should provide more of the information required for reaching a sound judgment.

Civil Defense

Further substantial progress was made during fiscal year 1963 in locating, marking, and stocking fallout shelters for emergency use. The rate of progress in providing such shelters for all Americans is, however, falling short of established objectives, particularly through the delay in the authorization of Federal financial assistance in the construction of shelters in schools, hospitals, and other nonprofit institutions. The civil defense program constitutes an integral part of our national security policy and, as such, merits the full support of the American people.

First among the civil defense objectives is the program for establishing over the next 5 to 6 years 240 million shelter spaces—a requirement that takes into account the daytime and nighttime distribution of population, particularly in urban areas. About 90 million of these spaces are expected to be located through the national shelter survey. Shelter construction in Federal buildings can provide 5 million additional spaces. Current studies indicate that the remaining 55 million might be obtained through the private initiative of homeowners and business organizations. The remaining spaces are planned to be incorporated into selected public and institutional buildings with the help of payments by the Federal Government.

The most encouraging progress during fiscal year 1963 was made in the national shelter survey phase of the civil defense program. An expansion of the survey was made possible as a result of technical studies indicating that the minimum protection factor could be lowered without undue risk from 100 to 40—that is, fallout radiation within shelters might be reduced from one-hundredth or less to one-fortieth or less of that outside. The revised standard opened up additional shelter space, especially in less populated areas where heavily con-

structed buildings with basements are scarce, and thus contributed to a better geographical distribution of shelters. In line with this criterion, the total number of potential spaces located rose to 104 million. It is estimated that about 70 million of these spaces can be licensed as public fallout shelters; an additional 20 million are expected to become available during the next few years through new construction and building modifications.

By the close of fiscal year 1963, owners of more than 50,000 buildings and other protective facilities had signed agreements that made emergency accommodations available for 47 million people. With the cooperation of State and local authorities, shelters for 43 million had been marked with distinctive signs. In addition, emergency supplies had been stored for nearly 10 million people in about 21,000 facilities—at an average cost to the Federal Government of \$2.42 per person. With the procurement actions initiated during the year, the emergency stocks delivered or on order will take care of 50 million shelter spaces.

The program for encouraging local authorities and nonprofit institutions to add shelter space to new and existing buildings by providing Federal assistance failed to receive congressional approval. Neither the request for \$460.0 million in the fiscal year 1963 budget nor that for \$175.0 million in the 1964 budget was authorized, although 90 million spaces might eventually become available under this program at a maximum cost to the Federal Government of only \$2.50 per square foot. It is hoped that further hearings and analyses by congressional committees will continue to demonstrate the value of this important phase of the national shelter program.

Substantial progress in the construction of shelters in Federal buildings is awaiting the removal of certain legal restrictions enacted. Because of these restrictions the bulk of the \$17.5 million previously made available for this purpose was not used. In the meantime, however, detailed plans have been developed that will make possible the rapid modification of existing Federal buildings for shelter space when the current obstacles are removed, and provisions for protective accommodations have been included in new construction designs.

To encourage home owners and business organizations to construct shelters on their own initiative, an extensive information and training program has been established, and Federal research and development projects are providing additional technical data on the most effective procedures to follow.

Supplementing the shelter program, a major effort was being made to strengthen the foundations required for a sound civil defense program. This included general research, shelter support programs, and further development of warning communications, radiological monitoring, and damage assessment systems.

More than 1,080,000 persons received civil defense instruction during the year, including 788,000 who were trained in medical self-help, 278,000 who registered in the civil defense adult education program, about 10,000 architects, engineers, and builders who participated in shelter construction workshops and training programs, and more than 4,000 key civil defense personnel who completed courses in civil defense schools. Substantial assistance was also given to State and local governments to assist them in carrying out their vital role in the over-all effort. A detailed account of all civil defense activities during the year is attached as Annex C to this report.

Primary responsibility for the civil defense program was transferred to the Department of Defense in August 1961 and assigned to the Office of Civil Defense (OCD), established as a separate civilian component of the Department. This arrangement has fostered closer cooperation between military and civil defense activities in planning an effective program and has greatly contributed to more efficient operations. For example, the Defense Supply Agency manages the procurement, storage, and wholesale distribution of shelter supplies; the Defense Communications Agency supervises the integration of civil defense communications with military circuits; the Army Corps of Engineers and the Navy Bureau of Yards and Docks assisted in the location of shelter spaces; and the reserve components of the armed forces encouraged Standby Reservists to accept assignments with local civil defense organizations. Moreover, the civil defense responsibilities of the armed forces in the event of nuclear attack were revised and clarified by a directive issued by the Secretary of Defense in April 1963. Under this guidance, active and reserve units not required for offensive or defensive operations will be used to assist local authorities in coping with emergency situations.

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Army

The Army continued to make major strides in fiscal year 1963 in building up its personnel strength, modernizing its equipment, and improving its battlefield mobility.

Its active duty strength, which had been set at 870,000 for fiscal year 1961, was raised to 960,000. In addition, an overstrength of 20,000 men was temporarily authorized for end fiscal year 1963 to reduce the hump in future training requirements caused by the quick expansion during the 1961 Berlin crisis, and another temporary increase of 15,000 was granted to test new concepts of air mobility. Actual Army strength on June 30, 1963, totaled 976,000 as compared to 859,000 2 years earlier and 1,066,000 at the close of fiscal year 1962, when two National Guard divisions and a large number of reservists were temporarily on active duty.

With a permanent increase of 90,000 men, the Army's divisional strength was raised from 11 combat-ready divisions and 3 training divisions to 16 combat-ready divisions. This expansion benefited above all the Army's strategic reserve in the continental United States, which now includes eight, instead of three, combat-ready divisions—an increase of about 170 percent. The oversea deployment of Army divisions remained unchanged during the year with five stationed in Europe and two in Korea, with one more in Hawaii as a theater reserve.

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As stated earlier, a substantial increase in our national security can be achieved by further progress in the civil defense program. It deserves the unqualified support of the American people.

General Purpose Forces

The buildup of our general purpose forces, in accordance with programs initiated in 1961 and subsequently expanded, is providing the United States with the ready strength required to counter all types of military aggression short of a major nuclear war. As a result, the United States has acquired a wider choice in the courses of action to follow in an emergency and, at the same time, potential aggressors have been given further warning against launching military ventures.

Emphasis has been placed on increasing readiness and mobility and on providing modern equipment, weapons, and munitions in sufficient quantities to maintain the existing forces in sustained combat. Qualitative improvement has been stressed rather than numerical

expansion. Nuclear capabilities have been supplemented with a substantial increase in nonnuclear striking power and, in the counterinsurgency field, all the Services have developed special warfare units, thoroughly trained to assist friendly countries in countering Communist subversion.

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All these divisions are being provided with greater firepower and improved tactical mobility. The divisional structure is being changed from the former pentomic pattern to the new ROAD concept, providing greater flexibility. This organizational change also affects nondivisional units, as infantry battle groups are being eliminated and the number of ROAD brigades increased. The ROAD reorganization is scheduled to be completed by the end of fiscal year 1964.

Equally important has been the quantitative and qualitative improvement in Army weapons and equipment accomplished in recent years. The funds made available for the procurement of such items were raised from \$1.5 billion in fiscal year 1961 to \$2.5 billion for 1962, remained the same for 1963, and were increased to \$3.0 billion for 1964. As a result, the Army's stock position has been improved considerably compared with that existing at the time of the 1961 Berlin crisis. In this buildup, the most urgent requirements have been first to remedy the most serious shortages and then to procure those modern weapons and equipment that promise the greatest increase in combat

effectiveness in relation to their cost. The established procurement objective is to have 22 divisions—16 active and 6 reserve divisions—adequately equipped and supported for combat for the entire period between D-day and the time when production lines are expected to catch up with combat consumption.

The modernization of Army weapons includes practically all types. Liquid-fueled surface-to-surface missiles, like the medium-range CORPORAL and the longer range REDSTONE, are being replaced by solid-fueled SERGEANT and PERSHING missiles. Still in the research and development stage are new air defense, antitank, and short-range surface-to-surface missiles. Substantial progress has been made in developing the Army's air capabilities with the delivery of new helicopters and fixed-wing aircraft for battlefield transport and surveillance. Rifles and machineguns are being modernized. A significant increase in firepower is being provided by a new family of self-propelled artillery. While existing deficiencies in tank requirements are being removed, a new improved main-battle tank has been placed under development. Similar modernization programs are under way for many other weapons and types of equipment.

As a further step to improve the Army's combat effectiveness, the so-called Howze Board on Tactical Mobility Requirements recently developed new tactical concepts calling for the creation of air assault divisions and air cavalry as well as air transport brigades. In view of the radical changes in equipment and tactical doctrine inherent in these proposals, the new concepts are being submitted to thorough field tests and evaluations carried out by provisional units especially organized for this purpose. These tests should provide essential information on the military effectiveness and cost of the new proposals and permit meaningful comparisons with alternative programs.

Navy and Marine Corps

While no major changes were made during fiscal year 1963 in the composition of Navy and Marine Corps forces, their striking power increased with the continued delivery of more modern weapons and equipment. Simultaneously, an intensive research effort has been going forward to develop still greater combat effectiveness in the years ahead, and long-range plans for maintaining our substantial naval supremacy have been submitted to a thorough review to determine the best solution to the many problems raised by the so-called "block obsolescence" of naval ships.

The personnel strength of the Navy rose from 627,000 on June 30, 1961, to 665,000 2 years later and the number of ships operated by the Navy from 819 to 857, including an increase in major combatant warships from 375 to 383. Comparison of the 1963 totals with those of 1962—666,000 men and 900 ships, including 397 warships—provides a less accurate indicator of the development of the permanent naval

establishment, since the 1962 figures include reserve personnel and reserve ships activated during the 1961 Berlin crisis and subsequently released.

These numerical comparisons fail to reveal the qualitative improvement in the fleet during the past 2 years. The number of attack carriers was the same in 1963 as in 1961—15—but the 1963 total includes the nuclear-powered *Enterprise* and two new *Forrestal*-type carriers, the *Kitty Hawk* and the *Constellation*. In the cruiser and destroyer categories, the number of guided missile ships has been considerably increased, including a nuclear-powered cruiser, the *Long Beach*, and a nuclear-powered frigate, the *Bainbridge*. The submarine fleet has been strengthened with delivery of additional nuclear-powered attack submarines. The Navy's ship construction program, which included only 25 new ships in the fiscal year 1961 budget, provided for 36 new ships in the 1962 as well as the 1963 budget, and a total of 31 new ships was approved by the Congress for fiscal year 1964.

The delivery of additional Skyhawk, Intruder, and Vigilante attack aircraft and Phantom fighters has strengthened the striking power of naval and Marine aviation. Already under development is the F-111 (TFX), which will eventually replace the Phantom. Improved air-to-air and air-to-ground missiles are increasing the combat effectiveness of these aircraft. The air defense capabilities of the fleet are being raised as more ships acquire TERRIER, TARTAR, and TALOS missiles. Research programs have been established to improve the operational characteristics of these missiles and to develop a new surface-to-air fleet missile system.

In the Antisubmarine Warfare (ASW) field, progress is being made in improving equipment, weapons, and tactics as well as in gaining further knowledge of the scientific problems that remain to be resolved. An extensive program in oceanography has been started. The management of ASW research and development has been reorganized to provide greater efficiency. The range of sonar and radar equipment has been extended and the reaction time of operational forces to submarine contacts greatly shortened. The delivery of more modern aircraft and helicopters and of additional nuclear-powered attack submarines has increased our capabilities to detect and destroy enemy submarines. Still, despite such improvements, the potential threat presented by hostile submarines remains a major one, and the ASW research program is being pursued with the greatest urgency.

The personnel level of the Marine Corps was increased in 1961 from 175,000 to 190,000 to provide the manpower needed for three combat-ready division/wing teams and the nucleus of a fourth team. The necessary adjustments for the implementation of this program were completed during fiscal year 1963 with the reorganization of a sub-

stantial part of the Marine Reserve into the units required for the formation of the fourth division and air wing. Modern weapons and equipment continued to be delivered in increased quantities in accordance with a phased procurement program designed to provide all the material needed to sustain four divisions and air wings in combat for a considerable time. The Marine Corps' amphibious lift capacity has been improved with the commissioning of new amphibious transport and assault ships, the latter especially designed to facilitate vertical assault missions.

A major study was initiated to establish a realistic long-range program for our naval forces, similar to the programs developed for ground and tactical air forces. The key problem to be resolved is the rate of new construction required to maintain our naval supremacy in the late 1960's and thereafter in view of the fact that over half of today's fleet was constructed during or shortly after World War II—almost 20 years ago. The correct answers to the questions raised by this problem will not be easy to find. A massive ship construction program would create another "block obsolescence" dilemma in the future. Ship rehabilitation and modernization might extend the useful life of some combatant types. The greater combat capabilities of modern ships might lower numerical requirements. Changes in weapons technology might call for new types of ships. Whatever the conclusions reached, they will insure that adequate naval power remains available to carry out the essential tasks required for our national security.

Tactical Air Forces

The urgent need for more adequate air support for Army ground forces was recognized in 1961, when it was decided to increase substantially the size of the tactical fighter force, accelerate its modernization, and provide sufficient materiel for sustained operations in a non-nuclear conflict.

The expansion goal of the fighter force, tentatively set at 5 wings or from 16 to 21 wings, had been practically achieved by the end of fiscal year 1963. The speed of this expansion was made possible primarily by holding within the active forces the F-84's brought in by the Air National Guard during the Berlin crisis. Simultaneously, however, procurement programs were greatly accelerated to provide the best available aircraft for the entire fighter force. The delivery in substantial numbers of Phantom F-4C fighters is scheduled for the immediate years ahead, and the F-111 (TFX)—equipped with variable sweep wings and turbofan engines—will provide an even more effective aircraft in the late 1960's. A parallel modernization is planned for tactical reconnaissance aircraft.

The serious shortages in tactical nonnuclear ordnance existing 2 years ago have been substantially reduced. Procurement programs for air-to-surface ordnance and associated materiel were increased from \$49 million for fiscal year 1961 to \$216 million for 1962 and \$244 million for 1963; \$198 million was approved for 1964. Particularly significant expansions were made in the purchase of BULLPUP air-to-surface missiles and cluster bomb units. Substantial progress was made in the development of plans to provide protection for parked tactical aircraft overseas against nonnuclear attack through the construction of earth-covered steel shelters.

Airlift and Sealift

The ability of military forces to counter aggression quickly wherever it occurs is a key factor in measuring their effectiveness. To meet this requirement, we have deployed part of our forces overseas, pre-positioned heavy combat equipment in key areas, and maintained a ready airlift and sealift capability for the strategic reserve stationed in the United States. The adequacy of the measures taken has been under intensive review since 1961, when it became evident that existing airlift capabilities fell far short of minimum needs.

As a result, the procurement program for long-range modern airlift aircraft was expanded in 1961 from 50 to 129 aircraft—99 C-130E's and 30 C-135's—and work was started on a new long-range C-141 jet transport. Delivery of the C-135's began in August 1961 and of the newly ordered C-130E's in March 1962; the first C-141 was completed during the summer of 1963. Subsequent procurement programs further increased the order for C-130E's and C-141's. By the end of fiscal year 1963 our airlift capability had been increased by nearly 60 percent over that of 1961, and current plans called for a fourfold increase by 1968.

With these developments, primary reliance for the future airlift of the regular forces will be shifted to the turboprop C-130E's and the turbofan C-141's. Piston engine aircraft, except for some assault transports with rather short takeoff and landing capabilities, will be gradually transferred to Air Reserve and Air National Guard units, which will maintain C-97's, C-119's, and C-124's fully ready for deployment within a 24-hour period. The new transports entering the inventory may also change current concepts of airlift operations, since it may become feasible to have them fly troops and equipment directly to the battle area rather than to oversea assembly points for reloading into assault transports. A comprehensive study of this problem, including the changes that may be required in global communications and control systems as well as in organization, has been started.

Additional airlift support in case of an emergency is provided by the Civil Reserve Air Fleet (CRAF) consisting of nearly 270 aircraft, of which about half are modern jets. The contracts concluded with private airlines contain special incentives for the further modernization of their inventory, thereby expanding their capability for assisting the armed forces when needed.

As for our sealift capabilities, the Military Sea Transportation Service (MSTS) manages a relatively small nucleus fleet wholly and instantly responsive to military needs and providing capabilities not ordinarily available in commercial ships. Increased airlift capacity is reducing the requirement for MSTS troop ships, but cargo ships and tankers, particularly types that can be used in primitive ports and shallow waters, will continue to be required. Qualitative improvements include new roll-on/roll-off cargo ships which require no special booms or cranes for unloading; three such ships have been authorized through fiscal year 1963 and consideration is being given to the construction of a roll-on/roll-off fleet capable of moving an entire armored division. The possibility of further reductions in lift requirements is being tested by the prepositioning of equipment in "floating depots" stationed in forward areas.

Reserve Forces

Improvement in the ability of the reserve components to augment the active forces on short notice and in considerable numbers has been a major objective in recent years. While the reserves continue to provide the base for large-scale mobilization in the event of general war, they render an even greater service to their country by maintaining selected units in a state of maximum readiness. Such readiness makes feasible a lower personnel level for the active forces and greatly increases our ability to meet the many possible contingencies that might threaten the national security. The importance of the mission carried by the reserves was illustrated during the 1961 Berlin crisis when nearly 150,000 Army, Navy, and Air Force reservists were mobilized, and again during the 1962 Cuban crisis when over 14,000 Air Force reservists were called to active duty for 1 month.

The need for modernization was recognized early in 1961, but the Berlin crisis not only delayed the implementation of plans but also pointed up deficiencies in readiness and in recall procedures. Accordingly, the reserve troop structure, particularly that of the Army National Guard and the Army Reserve, was reexamined, and new plans were prepared during 1962. These were discussed at length with interested committees and members of the Congress, with the State Governors, and with representatives of the National Guard and the Army Reserve. On December 4, 1962, the Secretary of Defense and the Secretary of the Army ordered the reorganization plan to be put

into effect, and by May 1, 1963, the necessary preliminary actions had been taken—1 month ahead of schedule and in time for the reorganized units to use their annual 2-week training periods during the summer of 1963 to maximum advantage in adjusting to the new structure.

A major result of the realignment was to increase from 47 to 66 percent the number of Army Ready Reservists serving in high priority units. The new manning and equipment levels of these units will enable them to support the active Army within weeks rather than months after mobilization. Specific features of the reorganization included:

Establishment of a priority force consisting of 6 National Guard divisions and supporting elements, 11 separate brigades, on-site air defense missile battalions, and other reinforcing units from the Guard and the Reserve needed for early operational deployment—manned at 75 to 80 percent of wartime strength and having readiness objectives ranging from a few hours to not more than 8 weeks.

Designation of 2 National Guard divisions and supporting units as theater reinforcements—manned at 70 percent of wartime strength with readiness objectives from 4 to 12 weeks.

Maintenance of an additional 15 National Guard and 6 Army Reserve combat divisions, 13 Army Reserve training divisions, and nondivisional supporting units—manned at 53 to 60 percent of wartime strength with longer readiness objectives.

Realignment of all reserve units to the new ROAD concept currently being adopted by the active Army.

Establishment of qualitative standards for Ready Reservists on drill-pay status equal to those prescribed for the active Army to assure the availability of properly trained personnel in an emergency.

Adoption of new procedures for the recall of units and individual "fillers."

Procurement of additional modern equipment for reserve units, particularly for those designated as high priority.

The reorganization of the Army reserve components involved the elimination of about 1,700 units excessive to current requirements and the activation of some 1,000 new units, including separate brigades and additional special forces companies. Included in the eliminated formations were 8 divisions—4 from the National Guard and 4 from the Army Reserve. Reservists from the disbanded units were encouraged to transfer to the new units, which were established in the same general locations.

The authorized strength levels for paid-drill training of 400,000 for the Army National Guard and 300,000 for the Army Reserve could not be reached during fiscal year 1963. Contributing factors included dislocations resulting from the Berlin mobilization, uncertainties con-

nected with the reserve reorganization, and higher standards for personnel. Despite an intensified recruiting effort, the Army National Guard had only 361,000 in paid-drill training status on June 30, 1963, and the Army Reserve only 237,000. Some increase in strength levels is anticipated during fiscal year 1964, but the authorized total of 700,000 probably will not be achieved, largely because of the relatively small number of men who will become available to the reserves from the active Army and the "6-month" training program.

The realignment of the Navy, Marine Corps, and Air Force reserve components to current mobilization objectives required smaller adjustments than those necessary for the Army. The Navy decided to reorganize its air reserve flying squadrons and units to provide more effective training and greater flexibility in responding to mobilization requirements. The Marine Corps Reserve, as noted above, completed the conversion of most of its training detachments to the tactical-type units needed for the fourth Marine division/air wing team. The Air National Guard began to carry out a program for increasing its airlift and tanker squadrons and reducing the number of air defense units.

Improvements in reserve legislation included the submission of a bill, approved after the end of fiscal year 1963, providing a standard 6-year period of reserve obligation and revising active duty training provisions for new reservists. The new legislation establishes a minimum of 4-month active duty training, eliminating programs which required as little as 8 weeks, and also provides an opportunity for new reservists to volunteer for active duty as long as necessary in order to qualify for positions requiring extensive technical training. The latter provision should help to reduce the need to recall prior-service personnel to fill the "hard skill" positions in reserve units as happened during the 1961 Berlin crisis.

Defense Space Programs

Expenditures for military space programs doubled between fiscal years 1961 and 1963, rising from \$0.7 billion to \$1.4 billion. They constituted 20 percent of the Department's total expenditures for research and development activities in fiscal year 1963. The objectives of the military space effort are: First, to develop and operate space systems that meet clearly defined national security requirements and, secondly, to establish a broad base of technology and experience on which to build such future systems as may eventually prove to offer substantial military utility. Expenditures during fiscal year 1963 were divided almost equally between these two objectives. In addition, Defense space activities benefited greatly from the various space programs assigned to other Federal agencies in accordance with a closely coordinated plan for achieving the goals of our national space policy.

National space objectives are established with the assistance of the National Aeronautics and Space Council. In keeping with the policies of the council, the space activities of the various agencies concerned have been developed into a truly joint effort. An Aeronautics and Astronautics Coordinating Board assures close cooperation between the National Aeronautics and Space Administration (NASA) and the Department of Defense. Agreements concluded between the two agencies during fiscal year 1963 covered such subjects as the extent of Defense participation in NASA's GEMINI project for the development of a two-man spacecraft, Defense support for NASA's synchronous-altitude communications satellite (SYNCOM) program, possible civilian use of the Defense navigational satellite system, the management and operation of missile ranges and launch facilities, and the development and procurement of launch vehicles. Continued support was also given to NASA's MERCURY project and other programs—with each MERCURY flight involving some 18,000 Defense personnel in every phase from launching preparations to final recovery. The joint efforts of the Atomic Energy Commission (AEC) and the Department of Defense included the development of a satellite-borne system for detecting nuclear explosions—part of the VELA program of the Advanced Research Project Agency—and of auxiliary nuclear power sources for satellites. The Department also explored with the new Communications Satellite Corporation—established on February 1, 1963, in accordance with the Communications Satellite Act of August 31, 1962—the possibility of adapting its satellite-borne communications system to military as well as civilian requirements.

Defense space programs aimed at specific military missions include the development of systems for communications, navigation and geodesy, detection of nuclear explosions and missile launchings, satellite tracking, and similar applications. In the field of communications, studies were continued during fiscal year 1963 investigating the use of medium altitude, random-spaced satellites in polar orbits for global communications coverage. A successful space shot under the WEST FORD project in May 1963 proved the technical feasibility of orbiting a belt of copper filaments around the earth and using these filaments as passive reflectors for relaying voice, teletype, and high-speed digital communications. The development of the navigational satellite system proceeded as planned with the launching of prototype satellites, the installation of shipboard equipment, and further evaluation of operational feasibility. The geodetic measurement satellite, ANNA 1B, launched on October 31, 1962, helped to determine the accuracy of long base-line surveys and to position long-range electronic navigation stations (LORAN-C) on certain Pacific islands; follow-on responsibility for the ANNA project was transferred to NASA in December 1962. Numerous other satellites were launched

during the fiscal year to improve our knowledge of space flight techniques and technology that might prove useful in meeting military requirements.

As for manned space flight, the Department of Defense not only participated in the extensive NASA program established for this purpose but also pursued various projects of its own to meet special military requirements or to contribute to the total national effort. Of particular interest to the Department has been NASA's GEMINI project to develop techniques of rendezvous and docking in orbit and to test man's ability to perform effectively under prolonged weightlessness. An agreement between the two agencies announced on January 22, 1963, established GEMINI as a national manned space flight program under the supervision of a joint Program Planning Board, thus assuring that tests will provide information needed not only for NASA's lunar landing efforts but also for maintaining manned satellites in near-earth orbits for lengthy periods—a matter of particular interest to the armed forces. The close relationship between GEMINI and Dyna-Soar (X-20), a Defense project testing the feasibility of a one-man space glider, was made the subject of thorough review to determine the extent to which each project could contribute to meeting military requirements in the future. Additional data on aerodynamic, structural, and physiological problems related to manned flight at hypersonic speeds and space-equivalent altitudes were obtained from numerous successful flights of the X-15 aircraft—a joint NASA-Defense undertaking.

The Defense role in the National Launching Vehicle Program is focused primarily on the development of large solid-propellant boosters. Substantial progress was made during the year on TITAN III, which—after a year of thorough program definition—was approved for development in December 1962. This booster will consist of a modified TITAN II ICBM combined with a pair of 120-inch diameter solid-propellant motors that can develop over 2,000,000 pounds of lift-off thrust and place 5,000 to 25,000 pounds of payload into low earth orbit. The first full-size 120-inch motor was successfully tested in July 1963 and research was continued on the development of 156-inch and 260-inch solid-propellant boosters.